Errors and Misprints

October 22, 2015

p. 9, l. 8 from bottom should read:
See Exercise 1.6.9 for a characterization

p. 9, l. 2/1 from bottom should read:
eigenvalue pairs with $r_1 + 2r_2 \leq d$. The real generalized eigenspaces are denoted by $E(A, \mu_k) \subset \mathbb{R}^d$ or simply E_k for $k = 1, ..., r := r_1 + r_2$.

p. 19, l. 3/4 should read: $E_k = E(\mu_k), k = 1, ..., r$, for the eigenvalues $\mu_k \in \mathbb{C}$ with $n_k = \dim E_k$.

p. 21, l. 13-15 should read:

$$\lim_{n\to\pm\infty} \frac{1}{n} \log |\lambda^n x_0| = \lim_{n\to\pm\infty} \frac{1}{n} \log (|\lambda|^n) + \lim_{n\to\pm\infty} \frac{1}{n} \log |x_0| = \log |\lambda| .$$

Furthermore, the Lyapunov exponent of the time-reversed equation $x_{n+1} = \lambda^{-1} x_n$ is $-\log |\lambda|$.

p. 32 In the commutative diagram, $\Phi(t, \cdot)$ above the bottom arrow should be replaced by $\Psi(t, \cdot)$.

p. 48, l. 23-25 should read:
Inspection of the phase portrait shows that the α-limit sets of all points different from $(\pm 1, 0)$ are given by $(0, \pm 1)$ and that the ω-limit sets of all points different from $(0, \pm 1)$ are given by $(\pm 1, 0)$.

p. 151, l. 8 should read:
(look at the small region below the $\delta = 0$-line in Fig. 7.1).

p. 199 replace lines 6-8 by:
Suppose that $u_k \to u$ in $\mathcal{U}$, fix $x \in L^1(\mathbb{R}, \mathbb{R}^m)$ and $\varepsilon > 0$. There is a function x_N from the set in Lemma 9.5.1 such that

$$\|x - x_N\|_1 = \int_{\mathbb{R}} \|x(t) - x_N(t)\| \, dt < \varepsilon.$$

p. 201 replace lines 13-20 by:

In order to see density of periodic functions pick $u^0 \in \mathcal{U}$ and fix $\varepsilon > 0$. We have to find a periodic function u_p with $d(u^0, u_p) < \varepsilon$. There is $N \in \mathbb{N}$ with

$$\sum_{n=N+1}^{\infty} \frac{1}{2^n} < \frac{\varepsilon}{2}.$$

Since the functions x_n are in $L^1(\mathbb{R}, \mathbb{R}^m)$, one finds $T > 0$ such that for $n = 1, \ldots, N$

$$\int_{\mathbb{R}\setminus[-T,T]} \|x_n(t)\| \; dt \; < \; \frac{\varepsilon}{2N \operatorname{diam} U}.$$

Define a periodic function by $u_p(t) = u^0(t)$ for $t \in [-T, T)$ and extend u_p to a $2T$-periodic function on $\mathbb{R}$. Then $u_p \in \mathcal{U}$ and

$$\begin{aligned}
d(u^0, u_p) &= \sum_{n=1}^{\infty} \frac{1}{2^n} \frac{\left| \int_{\mathbb{R}} [u(t) - u_p(t)]^\top x_n(t) dt \right|}{1 + \left| \int_{\mathbb{R}} [u(t) - u_p(t)]^\top x_n(t) \, dt \right|} \\
&\leq \sum_{n=1}^{N} \frac{1}{2^n} \frac{\left| \int_{\mathbb{R}} [u(t) - u_p(t)]^\top x_n(t) dt \right|}{1 + \left| \int_{\mathbb{R}} [u(t) - u_p(t)]^\top x_n(t) \, dt \right|} + \sum_{n=N+1}^{\infty} \frac{1}{2^n} \\
&\leq \sum_{n=1}^{N} \frac{1}{2^n} \left| \int_{\mathbb{R}} [u(t) - u_p(t)]^\top x_n(t) dt \right| + \frac{\varepsilon}{2} \\
&\leq \sum_{n=1}^{N} \operatorname{diam} U \int_{\mathbb{R}\setminus[-T,T]} \|x_n(t)\| \; dt \, + \frac{\varepsilon}{2} \\
&\leq \varepsilon.
\end{aligned}$$

p. 216, l. 1 from bottom: The last line should read:

$$D_{n,k} := \left\{ x \in X \,\middle|\, \frac{k}{n} \leq f^*(x) < \frac{k+1}{n} \right\}.$$

p. 247, l. 9: replace $\Phi_{n\Phi n}^\top$ by $\Phi_n^\top \Phi_n$.

p. 254, l. 11/12 replace Theorem 11.3.3(iii) by Proposition 11.3.3(iii).